Claims

[c1]   An apparatus for removing attached die, comprising:

a pivoting means, having a pivot point and first and second

sides, the pivot point having a corresponding first y coordinate,

the first and second sides positioned opposite to one another,

said pivoting means capable of attaching to a die carrier;

a shaft attached to the first side of the pivoting means;

a counterweight attached to the second side of the pivoting

means; and

a clamping means capable of attaching to at least one die, the

die having a corresponding second y coordinate, wherein the

first y coordinate is greater than the second y coordinate.

[c2]   The apparatus according to claim 1, further comprising:

A die carrier, the pivoting means attached to the die carrier;

and

a die positioned in said die carrier.

[c3]   The apparatus according to claim 1, wherein the clamping

means is clamped on at least one die.

[c4]   The apparatus of claim 1, wherein the clamping means is

clamped alone a centerline of the at least one die.

[c5]   A method for removing an attached die, comprising the steps

of:

a) identifying a die fixedly attached to a workpiece, the die to

be removed;

b) placing the workpiece in a die carrier;

c) identifying the removal force necessary to remove the die at a predetermined temperature, said predetermined temperature greater than the ambient temperature and said removal force less than the force necessary to remove the die at ambient temperature;

d) contacting the die to a removal means;

e) attaching a balancing force to the removal means, said balancing force at least equal to the removal force;

f) heating the die to the predetermined temperature;

g) removing the die from the workpiece with the removal means; and

h) removing the die from the removal means.

[c6]   The method of claim 5 wherein identifying the removal force comprises calculating the minimum force necessary to remove the die at the predetermined temperature and supplying a balancing force at least equal the necessary force.

[c7]   The method of claim 5 wherein the contacting comprises attaching the die to a removal means.

[c8]   The method of claim 7 wherein the removal means comprises: a pivoting means, having a pivot point and first and second sides, the pivot point having a corresponding first y coordinate, the first and second sides positioned opposite to one another;

a die carrier, the pivoting means attached to the die carrier;

a shaft attached to the first side of the pivoting means;

a counterweight attached to the second side of the pivoting means; and

a clamping means capable of attaching to a die, the die having a corresponding second y coordinate, wherein the first y coordinate is greater than the second y coordinate.

[c9]   The method of claim 8 wherein the counterweight comprises a weight substantially equal to the balancing force.

[c10]   The method of claim 9 wherein the identifying in step c comprises calculating the minimum force necessary to remove the die at the predetermined temperature and the attaching in step e comprises supplying balancing force about equal to the necessary force.

[c11]   The method of claim 10 wherein the calculating comprises the steps of :
determining the centerpoint of the die to be removed; and measuring the balancing force needed to remove the die from the centerpoint.

[c12]   The method of claim 11 wherein the balancing force supplied is about equal to the necessary force.

[c13]   The method of claim 5 wherein the step d precedes step e.

[c14]   The method of claim 5 wherein step e precedes step d.

[c15]   The method of claim 8 wherein the die follows an arc during

step g, each point in the arc having corresponding x and y

coordinates.

[c16]   The method of claim 15 wherein the arc is measured from the

die and the at least a portion of x coordinates for the arc are

increasing values.

[c17]   The method of claim 15 wherein the initial x coordinates during

step g are increasing values.